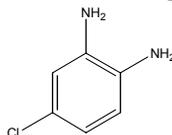


## 4-CHLORO-*o*-PHENYLENEDIAMINE

CAS No. 95-83-0

First Listed in the *Fourth Annual Report on Carcinogens*



### CARCINOGENICITY

4-Chloro-*o*-phenylenediamine is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (NCI 1978, IARC 1982a, b). When administered in the diet, technical-grade 4-chloro-*o*-phenylenediamine induced carcinomas of the urinary bladder in rats of both sexes and hepatocellular carcinomas of the liver in mice of both sexes.

No data were available to evaluate the carcinogenicity of 4-chloro-*o*-phenylenediamine in humans (IARC 1982a).

### PROPERTIES

4-Chloro-*o*-phenylenediamine occurs as a crystalline powder. It is slightly soluble in water, soluble in benzene and petroleum ether, and very soluble in ethanol and diethyl ether. It is available in the United States containing up to 2% ash and 2% moisture (IARC 1982a, HSDB 2000). This compound is incompatible with strong oxidizers and may be sensitive to prolonged exposure to air and light. When heated to decomposition, it emits toxic fumes of carbon monoxide, carbon dioxide, nitrogen oxides, and hydrogen chloride gas (NTP 2001).

### USE

4-Chloro-*o*-phenylenediamine has been patented as a hair dye component. No evidence was available to indicate that it is presently used commercially in the United States as a dye or dye intermediate. 4-Chloro-*o*-phenylenediamine is used as an oxidative base, a chemical intermediate to produce 5-chlorobenzotriazole (an isomer which is a photographic chemical), a curing agent for epoxy resins, and a reagent in gas chromatography (IARC 1982a, HSDB 2000).

### PRODUCTION

4-Chloro-*o*-phenylenediamine has been produced commercially in the United States since 1941 (IARC 1982a). The 1998 *Chemical Buyers Directory* (Tilton 1997) listed two suppliers of 4-chloro-*o*-phenylenediamine, *Chemyclopedia* 98 (Rodnan 1997) named one U.S. supplier, and Chem Sources (2001) listed 16 U.S. suppliers. In 1977, U.S. production was estimated to be approximately 1,000 to 10,000 lb (IARC 1982a). The 1979 TSCA Inventory identified one U.S. firm producing 6,000 lb in 1977 (TSCA 1979, HSDB 2000). There was one current U.S. manufacturer; however, recent production data were not available (HSDB 2000). No data on imports or exports were available.

## EXPOSURE

The primary routes of potential human exposure to 4-chloro-*o*-phenylenediamine are ingestion, inhalation, and dermal contact (NTP 2001); however, the extent of human exposure to this chemical is unknown (IARC 1982a). Exposure could occur during its production and use, or following accidental releases. Because of its limited use in consumer products, little exposure is expected in the general population. Nevertheless, exposure could potentially occur if residues were present in some hair dyes or in products made from 5-chlorobenzotriazole.

## REGULATIONS

EPA regulates 4-chloro-*o*-phenylenediamine under the Toxic Substances Control Act (TSCA), subjecting it to reporting rules.

OSHA regulates the compound under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table 41.

## REFERENCES

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